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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/812,349

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Tomoo Iijima

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TESSERA

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EXAMINER

KALAM, ABUL

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/812,349	<b>Applicant(s)</b> IIJIMA ET AL.	
	<b>Examiner</b> ABUL KALAM	<b>Art Unit</b> 2814	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 November 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 52-66 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 52-66 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/1/07</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 8, 2007, has been entered.

### ***Claim Rejections - 35 USC § 112***

2. Claims 55 and 60-66 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In lines 2-3 of claim 55, the limitation of wherein "said top face of each of said plurality of metal bumps is concave," is indefinite because it contradicts the limitation of "said top faces being flush with exposed regions said major surface of said insulating film," in lines 12-14 of claim 52, which claim 55 depends from. How can the top faces of said metal bumps be concave and still be flush with the major surface of the insulating film? While Figure 5A of Applicant's specification shows the top faces of the metals bumps being flush with the surface of the insulating film, Figure 5B illustrates wherein the top faces of the metal bumps (6a) are concave. However, the top faces are no longer flush with the insulating film in Figure 5B.

In lines 11-13 of claim 60, the limitation of wherein "metal bumps having upwardly facing concave top faces, said top faces being flush with exposed regions of said major surface of said insulating film," is indefinite because the limitations of "concave top faces" and "said top faces being flush with...said insulating film" are contradictory to each other, as shown in FIG. 5B of Applicant's specification. Claims 61-65 depend from claim 60, and thus are also rejected from the same issues.

In lines 11-18 of claim 66, the limitation of wherein "said top faces of each of said metal bumps has an edge portion adjacent to a wall of said insulating film and a middle portion distal from said wall, wherein a height of said middle portion above said first metal layer is less than a height of said edge portion above said first metal layer, said top faces being flush with exposed regions of said major surface of said insulating film," is indefinite because the top faces of the metal bumps can not be flush with the insulating film as claimed, since it is also claimed that a middle portion of the top faces has a different height than edge portions of the top faces.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 52-54 and 56 are rejected under 35 U.S.C. 102(e) as being anticipated by Chung (US 6,376,769).

Regarding claims 52 and 56, Chung discloses a wiring circuit panel (fig. 16) comprising: a first metal layer 332, having a major surface extending in lateral direction, said first metal layer 332 including a wiring circuit pattern 313; an insulating film 310, col. 18 line 31, overlying said major surface of said first metal layer 332, said insulating film 310 having a major surface remote from said major surface of said first metal layer 332/313; a plurality of discrete solid metal bumps 315 overlying said first metal layer 332/313 and extending upward through openings in said insulating film 310, said plurality of metal bumps having upwardly facing top faces, said top faces being flush with exposed regions of said major surface of said insulating film 310, fig. 16; and a plurality of solder balls 334 disposed in contact with said top of said plurality of metal bumps 315, said plurality of solder balls 334 being in conductive communication with said metal bumps 315; and a second circuit panel 340 having a substantially rigid dielectric element (print circuit board), col. 20 line 22 and a second wiring circuit pattern

overlying at least a portion of said rigid dielectric element (inherently a printed circuit board has circuit pattern), said second circuit panel 340 being joined to said flexible circuit panel 310 such that said second wiring circuit pattern conductively communicates with said wiring circuit panel of said flexible circuit panel through said plurality of metal bumps 315 (fig. 16).

Regarding claims 53-54, Chung discloses the wiring circuit wherein the first metal layer and plurality of bumps consist essentially of copper, col. 20 line 4; and wherein at least a portion of insulating film 310 is flexible, col. 18 line 31.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 57-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung ('769) in view of Applicant's Admitted Prior Art (APA).

Regarding claim 57, Chung discloses the wiring circuit panel as claimed in claim 52, the first metal layer 332/313, said plurality of metal bumps 315 overlying said first metal layer 332/313.

But, Chung does not disclose the wiring circuit panel further including a second metal wherein said second metal layer is an etch stop layer which substantially resists an etchant which would attack a first metal included in said first metal layer.

However, APA discloses the wiring circuit panel further including a second metal 8 (20b) wherein said second metal layer is an etch stop layer which substantially resists an etchant which would attack a first metal 10 (20c) included in said first metal layer, specification page 3 lines 1-7. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the second barrier layer 8 (20b) teaching of APA with Chung's device, because it would have provided the protection for the wiring layer as taught by APA, specification page 3 lines 6-7.

Regarding claims 58-59, Chung discloses the wiring circuit panel as claimed in 57 comprises plurality of metal bumps 315, wherein said plurality of metal bumps 315 and said first metal layer 332/313 consists essentially of a first metal.

The process limitations of wherein "metal bumps are formed by etching a third metal layer overlying said second metal layer," in claim 58, do not carry weight in a claim drawn to a structure. In re Thorpe, 277 USPQ 964 (Fed. Cir. 1985).

***Response to Arguments***

5. Applicant's arguments filed on October 3, 2007, have been considered but are not persuasive.

Regarding claim 52, Applicant argues that regarding the solid metal bumps, Chung only teaches conductive paste or plating. The argument is not persuasive, because in col. 18, lines 28-30, Chung states that conductive vias 315 are provided by a deposit of oxidation resistant metal. Furthermore, in Figs. 15B, 16 and 17, Chung shows wherein the metal bumps 315 are flush with the exposed major surface of the insulating film 310.

***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abul Kalam whose telephone number is (571)272-8346. The examiner can normally be reached on Monday - Friday, 9 AM - 5 PM.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/A. K./  
Examiner, Art Unit 2814

/Phat X Cao/  
Primary Examiner, Art Unit 2814